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IN THE CLAIMS

- 1. (canceled)
- 2. (previously presented: A method in accordance with Claim 31 wherein the particular number x has a binary exponent e in addition to the particular number x has a binary exponent e in addition to the content e in addition e in e in addition e in e

and further wherein computing a value of live(x) it is the time in any floating point representation of the particular number x comprises the area of

partitioning a mantissa m of a binary representation of x including a binary exponent e and the binary mantissa m wherein a first, most significant part of the partition corresponds to a region a where a is a distance of a matrix a is a distance of a matrix a in to reference point

$$a_i = 1 + \frac{i + 0.5}{N}$$
; and

computing an approximation to leg(x), using a polynomial of first degree in m and a precomputed value of $log(a_i)$.

3. (original) A method in accordance with C = 2 wherein computing the approximation to log(x) comprises the step of computing argument are proximation written as:

$$\log(m) \approx \log(a_i) + \frac{(m - a_i)}{a_i}$$

where a_l is a closest reference point to the shary interiors m of the number x; and

$$1 \le a_i < 2$$
.

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- 4. (canceled)
- 5. (previously presented) A method is accordance with Claim 32 further comprising the steps of precomputing a value for $(o_2/2)$, and the steps of precomputing each value of b_i and c_i .
- 6. (original) A method in accordance with Claims further comprising the step of storing the precomputed values of a and c_i in a local up takes.
- 7. (original) A method in accordance with Claim 2 wherein the number x is represented by a 32-bit representation having a significance with the exponent, and a 23-bit binary mantissa m having bits b_{22} to b_0 in order of significance with the exponent, and a 23-bit binary significance; and the step of partitioning the mantissa m contrains the step of selecting a first group of bits b_{22} through b_{16} as index a and bits b_{12} surprises the step of selecting a first
- 8. (previously presented) A method is accordance with Claim 31 utilized in a computed tomography (CT) scanner for generating an limate of an object from acquired projection data of the object.
- 9. (original) A methor is accordance with Clinic S wherein said natural logarithm is used in an image reconstructor to exercise the image of the open.
- 10. (original) A method in secondance with Claim & wherein the particular number x has a binary exponent e in addition to the binary mantissa.

and further wherein computing a value of the particular number of complises the state of the particular number of complises the state of the particular number of complises the state of the particular number number of the particular number of the particular number of the

partitioning a mantissa m die binary representation of x including a binary exponent earld the binary examines. Wherein a first, most significant

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part of the partition corresponds to a region Δx , where Δx is a distance from matrix same to reference point

$$a_i = 1 + \frac{i + 0.5}{N}$$
; and

computing an approximation to $\log(x)$, using a polynomial of first degree in m and a precomputed value of $\log(a_i)$.

11. (original) A method in accordance with Class I wherein computing the approximation to log(x) comprises the step of computing are approximation written as:

$$\log(m) \approx \log(a_i) + \frac{(m - a_i)}{a_i}$$

where a_i is a closest reference point to the mantissal z and

$$1 \le a_i < 2$$
.

- 12. (canceled)
- 13. (previously presented) A method in accordance with Claim 33 further comprising the steps of precomputing a value for $\log(2)$, and, for each it metomputing each value of b_i and c_i .
- 14. (original) A method in accordance with Older 15 further comprising the step of storing the precomputed values of k, and c, in a local up take.
- 15. (currently amended) A computing device desprising a memory in which binary floating point representations of particular numbers are stored, said device being configured to:

partition a mantissa region between 1 and 2 into Weiniah spaced sub-regions;

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precompute centerpoints a_i of each of the N equally space sub-regions, where i=0,...,N-1, wherein N is sufficiently large so that within each sub-region a first degree polynomial in m computes $\log(m)$ to within a presclected degree of accuracy for any m within the sub-region, where m is a mantissa of a binary fibrating point represents that m is a number; and

compute a value of $\log(x)$ for a binary floating poir a enessentation of a particular number x stored in said memory utilizing the first degree polynomia in x, wherein $\log(x)$ is a function of a distance between a_i and the manticular and

generate an image by using the computed value of ager

16. (original) A computing device in accordant with Claim 15 wherein the particular number x has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e has a binary exponent e in addition to the particular number e in addition to the particular number e in the particular number e in addition to the particular number e in addition e in the particular number e in the pa

and wherein said device being configured to compute a value of log(x) for the binary floating point representation of the particular number a continues said device being configured to:

partition a mantissa m of a time are representation of x including a binary exponent e and the e time partition of x including a binary exponent e and the e time partition of x including a binary exponent e and the e time partition of the partition corresponds to a region Δx where Δx is a distance; from mantissa m to reference point

$$a_i = 1 + \frac{i + 0.5}{N}$$
; and

compute an approximation at log(x), using a polyndic at of first degree in m and a precomputed value of $log(a_i)$.

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17. (original) A computing device in accordant with Claim 16 wherein said device being configured to compute the agroximation to log(x) can make said device being configured to compute an approximation writer as:

$$\log(m) \approx \log(a_i) + \frac{(m-a_i)}{a_i}$$

where a_i is a closest reference point to the pinary x; and $1 \le a_i < 2$.

- 18. (canceled)
- 19. (previously presentse) A computing device it as condance with Claim 33 further configured to precompute a value for $\log(2)$, and, for each 2 to precompute each value of b_i and c_i .
- 20. (original) A complifing device in accordance with Claim 19 further configured to store the precomputed values of b and c in a look up table.
- 21. (original) A computing device in accordance with Claim 16 wherein the number x is represented by a 32-bit representation having a sign by a 32-bit exponent, and a 23-bit binary mantissa m having bits b_{22} to b_0 in order of significance; with b_{22} being a bit of greatest significance; and wherein said device being configured to select a first group of bits b_{22} through b_{16} as index i and bits b_{15} through b_0 as Δx .
- 22. (original) A computing device in accordance with Claim 15 in a computed tomography (CT) scanner and utilized by said CI scanner described tomography (CT) scanner are image of an object from acquire, a priection data of the object.

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- 23. (original) A computing device in accordance with Claim 22 wherein said CT scanner utilizes said computing device to calculate natural localism in an image reconstructor to generate the image of the object.
- 24. (original) A computing device in accordance with Claim 22 wherein the particular number x is stored with a binary exponent and a section to the binary mantissa m;

and further wherein said device being configured to example a value of log(x) for the binary floating point representation of the particular number of samples said device being configured to:

partition a mantissa m of a strong representation of x including a binary exponent e and the binary mantissa m, where x a first, most significant part of the partition corresponds to a region i and a second, less significant part of the partition corresponds to a region Δx , where x is a distance from in x is x to reference point

$$a_i = 1 + \frac{i + 0.5}{N}$$
; and

compute an approximation to $\log(x)$, using a polyeograph of first degree in m and a precomputed value of $\log(a_i)$.

25. (original) A computing device in accordance will Claim 24 wherein said device being configured to compute the approximation to log(x) examples said device being configured to compute an approximation writes as:

$$\log(m) \approx \log(a_i) + \frac{(m-a_i)}{a_i}$$

where a_i is a closest reference point to the mantiss a_i

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 $1 \le a_i < 2$.

- 26. (canceled)
- 27. (previously present at A computing device it accordance with Claim 34 further configured to precompute a value is log 2), and, for each take precompute each value of b_i and c_i .
- 28. (original) A computing device in a coordant c or c Claim 27 further configured to store the precomputed values of b_1 and c in a lock-up table.
- 29. (previously presenter A method is accordance with Claim 31 further comprising using the approximation to processed least one image of a graduate of interest.
- 30. (previously presented A computing device it as ordance with Claim 15, said computing device further configure to use the value of ic with process at least one image of an object of interest.
- 31. (currently amended a method for computer an approximation of a natural logarithm function comprising the steps of:

partitioning a mantissa region between 1 and 2 into N equally spaced sub-regions; precomputing centerpoints at of each of the N equally spaced sub-regions, where $i=0,\ldots,N-1$;

selecting N sufficiently large so that, for each subtregion a first degree polynomial in m computes $\log(m)$ to within a prescienced degree of accuracy for any m within the sub-region, where m is a binary mantissa of a smarty floating point regressipation of a number; and

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computing a value of $\log(x)$ for a binary floating it is in presentation of a particular number x stored in a memory of a sompating device utilities it is first degree polynomial in m, wherein $\log(x)$ is a function of a distance between a, and b is a function of a distance between a, and b is a function of a distance between a, and b is a function of a distance between a, and b is a function of a distance between a.

generating an image by using the computed value in to sail

32. (previously presents) A method in according with Claim 2 wherein computing an approximation to log(x) comprises the step of computing an approximation written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + \epsilon \log(2)$$

for
$$i = 0, ..., N-1$$

where:

$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 = 1 + \frac{1}{2N} \cdot \frac{1}{a_i}; \text{ and } c_i = -1/a_i.$$

33. (previously presented) A method in accordance with Claim 10 wherein computing an approximation to local comprises the step of configuration written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + c_i \log(2)$$

for
$$i = 0, ..., N-1$$

where:

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$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 - \left(\frac{1}{2N}\right) \cdot \frac{1}{a_i} \quad \text{and} \quad c_i = -1/a_i.$$

34. (previously presented A computing device in accordance with Claim 16 wherein said device being configured to compute an approximation to logic) comprises said device being configured to compute an approximation written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + e \approx \log(2)$$

for
$$i = 0, ..., N-1$$

where:

$$b_{i} = -\log(a_{i}) + \left(\frac{1}{4a_{i}N}\right)^{2} - \left(\frac{1}{2a_{i}N}\right)^{\frac{1}{2a_{i}}} \cdot \frac{1}{a_{i}} \cdot \frac{1}{$$

35. (previously presented) A computing device in accordance with Claim 24 wherein said device being configured to compute an approximation to cg(x) comprises said device being configured to compute an approximation written as:

$$y = -\log(x) \approx b_i + c_i \Delta x + e_i \log(2)$$

for
$$i = 0, ..., N-1$$

where:

$$b_i = -\log(a_i) + \left(\frac{1}{4a_iN}\right)^2 - \left(\frac{1}{1}\right) + \left(\frac{1}{2N}\right) \cdot \frac{1}{a_i}$$
 and
$$c_i = -1/a_i.$$

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